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Four East Asian Spiders of the Families Eresidae, Araneidae, Thomisidae and Salticidae (Arachnida, Araneae)¹⁾

By

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Abstract Four species of the spiders of the families Eresidae, Araneidae, Thomisidae and Salticidae from eastern Asia are reported. *Stegodyphus tibialis* (O. PICKARD-CAMBRIDGE, 1869) (Eresidae) is newly recorded from northwestern Thailand. This record indicates the easternmost locality in the spiders of the genus *Stegodyphus* known at present. Three new species are described, that is, *Cyrtarachne melanoleuca* sp. nov. (Araneidae; from eastern Thailand), *Sanmenia kohi* sp. nov. (Thomisidae; from Singapore) and *Onomastus kanoi* sp. nov. (Salticidae; from the Ryukyu Islands, southern Japan). *Sanmenia kohi* sp. nov. is the second species of the genus hitherto known only from Japan and China. The peculiar jumping spider genus, *Onomastus*, is recorded as new to the Japanese fauna.

Since I was employed as a curator in the National Science Museum, Tokyo, I devoted my time to studying arachnology and accumulating data of the spiders occurring in Japan and other Asian countries. The specimens of arachnids were collected from these countries during the researches of the expeditions made by the museum or presented by scientists and many collaborators; the number of individuals may reach a hundred thousand.

Though the collection of the museum seems invaluable, an intensive study in systematics on the specimens is required for application to practical sciences, for instance, ecology and zoogeography, because most of the specimens were not determined in the species level. In the present paper four species of spiders of the families Eresidae, Araneidae, Thomisidae and Salticidae from Japan, Thailand and Singapore, including three species new to science will be reported. Of these, the interesting eresid, *Stegodyphus tibialis*, and a new species of Araneidae were obtained during a zoological expedition made by the Institute of Scientific and Technological Research, Thailand and the National Science Museum, Japan, in

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Thailand in 1987, and a new salticid was discovered by me in Okinawa Island, Japan, in a field research supported by the Grant-in-aid from the Ministry of Education, Science, Sports and Culture, in 1993. Through the courtesy of Mr. J. KOH, I obtained many specimens of thomisid spiders from Singapore. A new species from his collection will also be described in this paper.

The abbreviations used in the present paper are as follows. ALE, anterior lateral eye(s); ALE-ALE, distance between ALEs; AME, anterior median eye(s); AME-AME, distance between AMEs; AME-ALE, distance between AME and ALE; PLE, posterior lateral eye(s); PLE-PLE, distance between PLEs; PME, posterior median eye(s); PME-PME, distance between PMEs; PME-PLE, distance between PME and PLE; chaetotaxy of prosoma see SCHICK (1965).

The type specimens to be designated herewith are deposited in the collection of the Araneae at the Department of Zoology, National Science Museum, Tokyo (NSMT-Ar).

I wish to express my sincere thanks to Dr. Rokuro KANO, Professor Emeritus (Former President), Tokyo Medical and Dental University, for kind advice in the course of zoological expeditions to Asia, to Mr. Joseph K. H. KOH, Ministry of Defence, Singapore, for offering interesting specimens, to Mr. Akio TANIKAWA, Shichirigahama Senior High School, Kanagawa, Japan, for informations in Araneidae, and to all the staff of the Institute of Scientific and Technological Research, Bangkok, Thailand, for their kind aid in field research.

Family Eresidae

Stegodyphus tibialis (O. PICKARD-CAMBRIDGE, 1869)

(Figs. 1-3, 22)

Eresus tibialis O. PICKARD-CAMBRIDGE, 1869, p. 71, pl. 6, figs. 70-71 [male holotype from Mysore, India, in the Hope Entomological Collections, University Museum, Oxford, reexamined by KRAUS & KRAUS (1988)].

Stegodyphus tibialis: SIMON, 1884, p. 243.—POCOCK, 1900, p. 210.—PHANUEL, 1963, p. 305, pl. 1, figs. 1-9.—KRAUS & KRAUS, 1988, p. 226, figs. 199, 208, 218-223.

Stegodyphus socialis POCOCK, 1900, p. 209, synonymized with *S. tibialis* by KRAUS & KRAUS (1988) [female holotype from Bangalore, southern India, in the Natural History Museum, London, reexamined by KRAUS & KRAUS (1988)].

Specimen examined. 1♂, Lan Sang (written also Lang Sang, Larn Sang), 300m alt., about 20km SW of Tak, northwestern Thailand, 1-IX-1987, M. OWADA & H. ONO leg. (NSMT-Ar 3245).

Notes. This species was known to be distributed in India and Myanmar (KRAUS & KRAUS, 1988). Therefore it was accountable that this species also occurs in Thailand. The locality of the present record indicates the easternmost

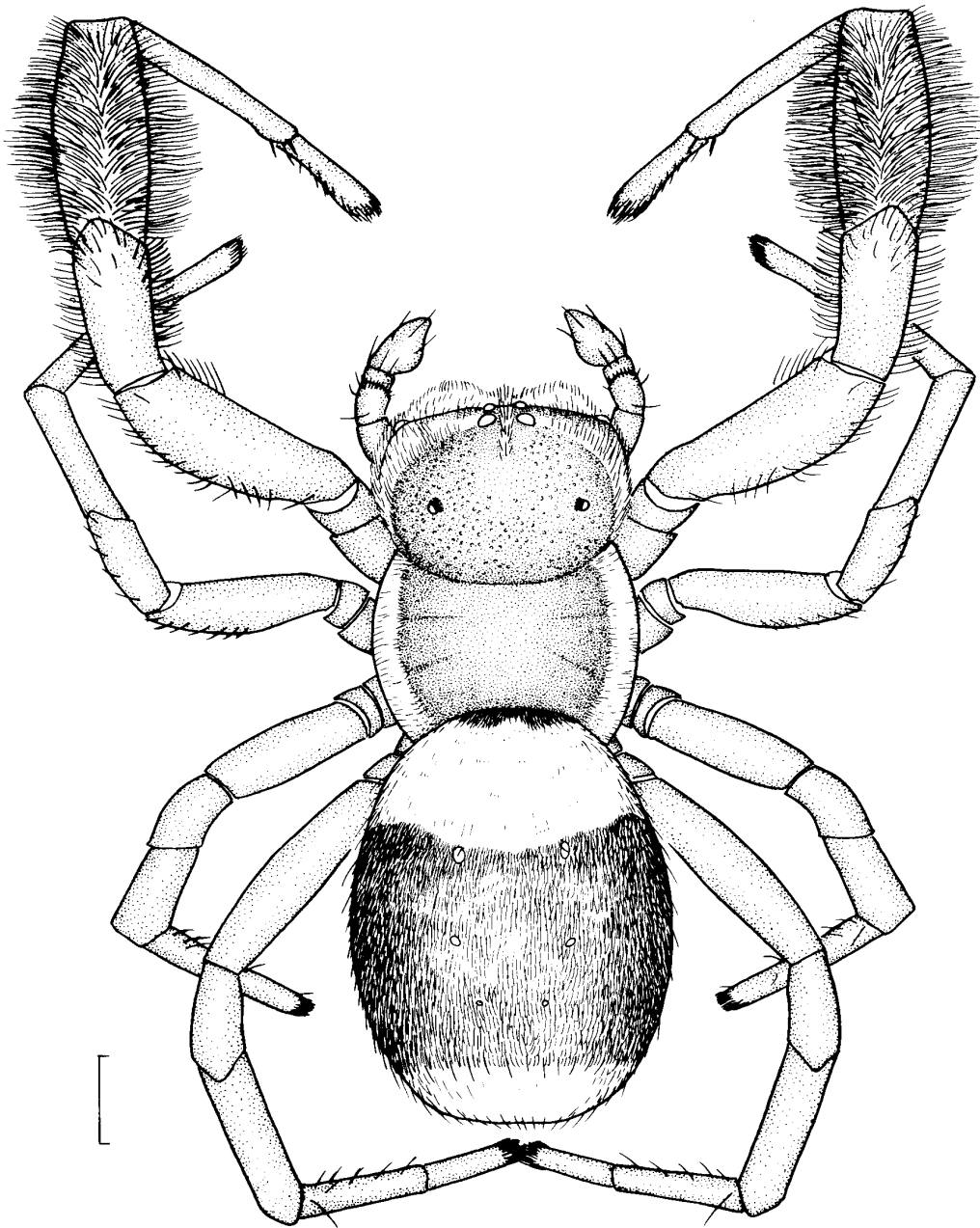
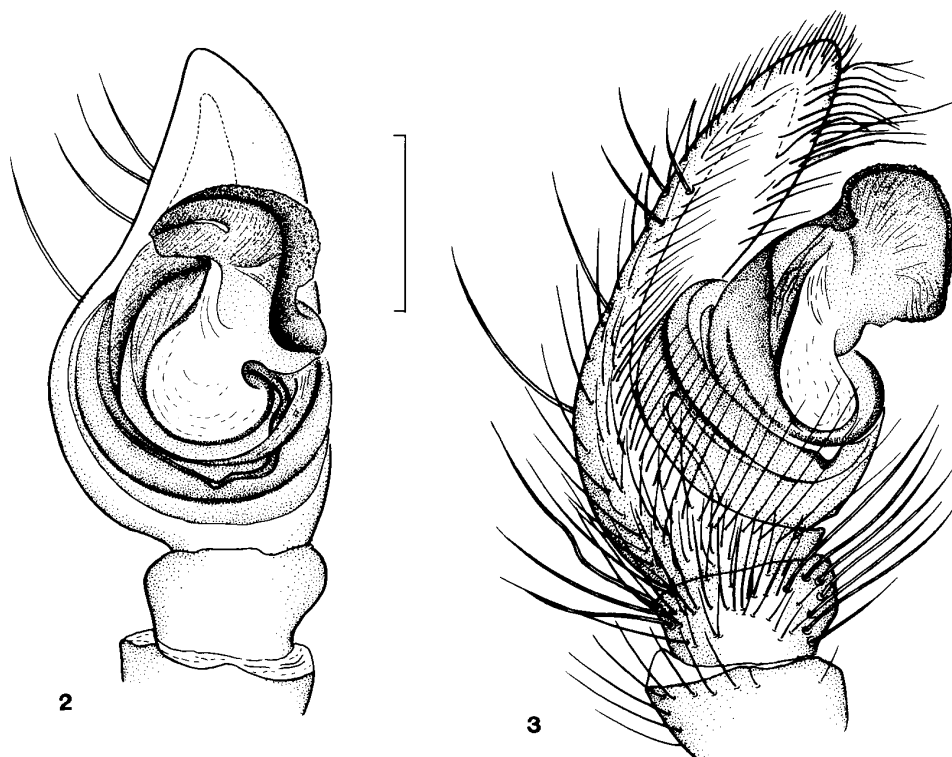


Fig. 1. *Stegodyphus tibialis* (O. PICKARD-CAMBRIDGE, 1869), male from Thailand. (Scale: 1 mm.)

point in the distributional range of the spiders of the genus *Stegodyphus*. This species is a social spider. However, the present specimen was collected on the ground and its nest was not observed.



Figs. 2–3. *Stegodyphus tibialis* (O. PICKARD-CAMBRIDGE, 1869).—2, Male palp, ventral view; 3, same, prolateral view. (Scale: 0.5 mm.)

Family Araneidae

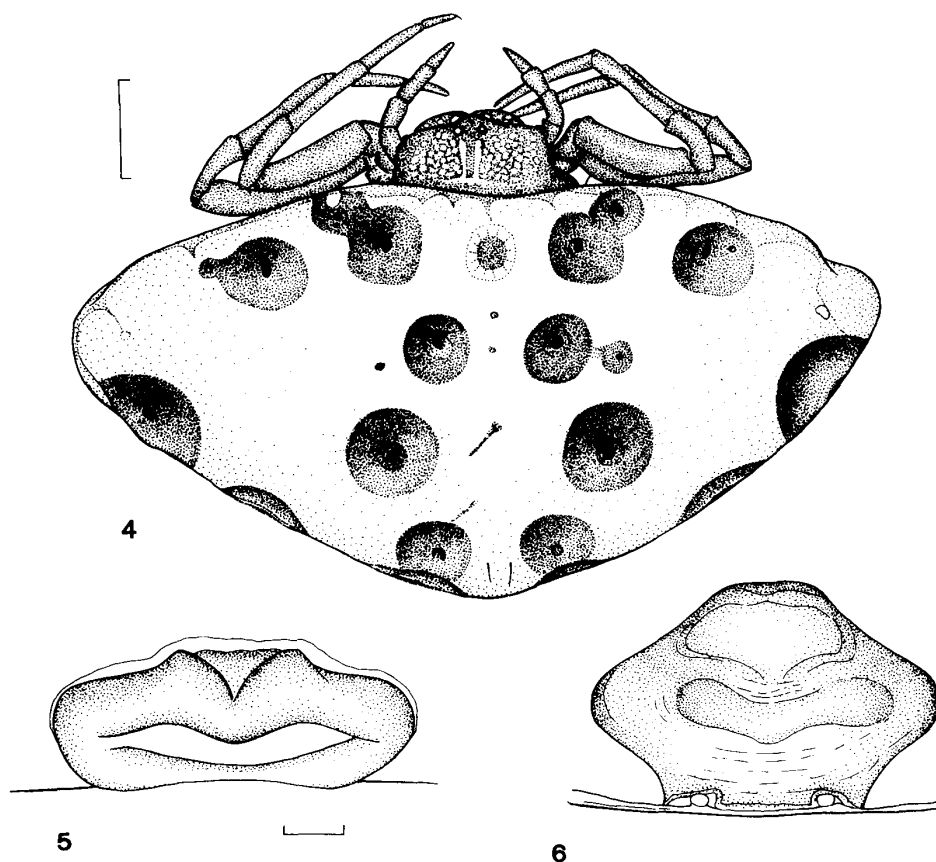
Cyrtarachne melanoleuca sp. nov.

(Figs. 4–6, 24)

Type specimen. Holotype: ♀, Phu Rua National Park, 900 m alt., Loei Province, Thailand, 21–VIII–1987, H. ONO leg. (NSMT–Ar 3229).

Description (based on the female holotype). Measurement: Body length 4.52 mm; opisthosoma length 3.78 mm, width 7.85 mm; lengths of legs [total length (femur + patella + tibia + metatarsus + tarsus)]: I 5.13 mm (1.68 + 0.83 + 1.13 + 1.00 + 0.49), II 5.10 mm (1.69 + 0.83 + 1.10 + 1.00 + 0.48), III 3.77 mm (1.25 + 0.59 + 0.88 + 0.65 + 0.40), IV 5.31 mm (1.95 + 0.80 + 1.20 + 0.93 + 0.43).

Prosoma. Eyes subequal in size, the anterior median one the largest and the anterior lateral one the smallest; AME–AME/AME–ALE 0.35, PME–PME/PME–PLE 0.43, median ocular area almost quadrate, the anterior side a little wider, clypeus almost same as the diameter of AME. Both the margins of fang furrow of chelicera respectively with three strong teeth; labium wider than long (length/width 0.60); sternum as long as wide. Palpal claw with two teeth; legs without spines; leg formula IV–I–II–III.



Figs. 4–6. *Cyrtarachne melanoleuca* sp. nov., female holotype from Thailand.—4, Pro- and opisthosomata, dorsal view; 5, epigynum, ventral view; 6, same, posterior view. (Scales: 4, 1 mm; 5–6, 0.1 mm.)

Opisthosoma much wider than long (length/width 0.48). Female genitalia: epigynum with a large depression and wide rim, septum absent, lateral margins expanded (Figs. 5–6).

Coloration and markings (Figs. 1 and 24). Prosoma dark brown, cephalic part reticulated, median ocular area darker, chelicera dark brown with red fang, maxillae and labium brown, sternum blackish brown, legs and palps chestnut brown. Opisthosoma pure white, with nine pairs of black spots and yellow anterior margin; venter black, spinnerets brown.

Remarks. This new species resembles *Cyrtarachne schmidi* TIKADER, 1963, described from India, in the shape of opisthosoma, but can be distinguished from the latter by the coloration and the shape of epigynum, especially the expanded lateral margins.

The specific name is derived from the coloration of opisthosoma.

Family Thomisidae

Sanmenia kohi sp. nov.

(Figs. 7-15)

Type specimens. Holotype: ♂, Rifle Range Road, Singapore, 7-II-1989, J. K. H. KOH leg. (NSMT-Ar 3246); paratype: 1 ♀, Greenwood Avenue, Singapore, 14-II-1989, J. K. H. KOH leg. (NSMT-Ar 3247).

Description (based on the male holotype and female paratype). Measurement: Body length ♀ 3.33 mm, ♂ 2.44 mm; prosoma length ♀ 1.63 mm, ♂ 1.26 mm, width ♀ 1.70 mm, ♂ 1.30 mm; opisthosoma length ♀ 1.85 mm, ♂ 1.33 mm, width ♀ 1.48 mm, ♂ 1.04 mm; lengths of legs [total length (femur + patella + tibia + metatarsus + tarsus)]: ♀, I 6.63 mm (2.00 + 0.85 + 1.85 + 1.41 + 0.52), II 6.91 mm (2.07 + 0.92 + 1.96 + 1.44 + 0.52), III 3.57 mm (1.11 + 0.59 + 0.85 + 0.67 + 0.35), IV 4.11 mm (1.33 + 0.52 + 1.04 + 0.85 + 0.37), ♂ I 5.64 mm (1.67 + 0.59 + 1.56 + 1.26 + 0.56), II 5.70 mm (1.70 + 0.59 + 1.59 + 1.30 + 0.52), III 2.88 mm (0.89 + 0.40 + 0.74 + 0.52 + 0.33), IV 3.21 mm (1.03 + 0.37 + 0.81 + 0.67 + 0.33).

Prosoma slightly wider than long (length/width ♀ 0.96, ♂ 0.97), setae indistinct with the exception of six setae on clepeus (C1, 3, 4), two on prodiscus (P1) and two behind PLE (S1). Eyes: AME very small, ALE/AME ♀ 2.50, ♂

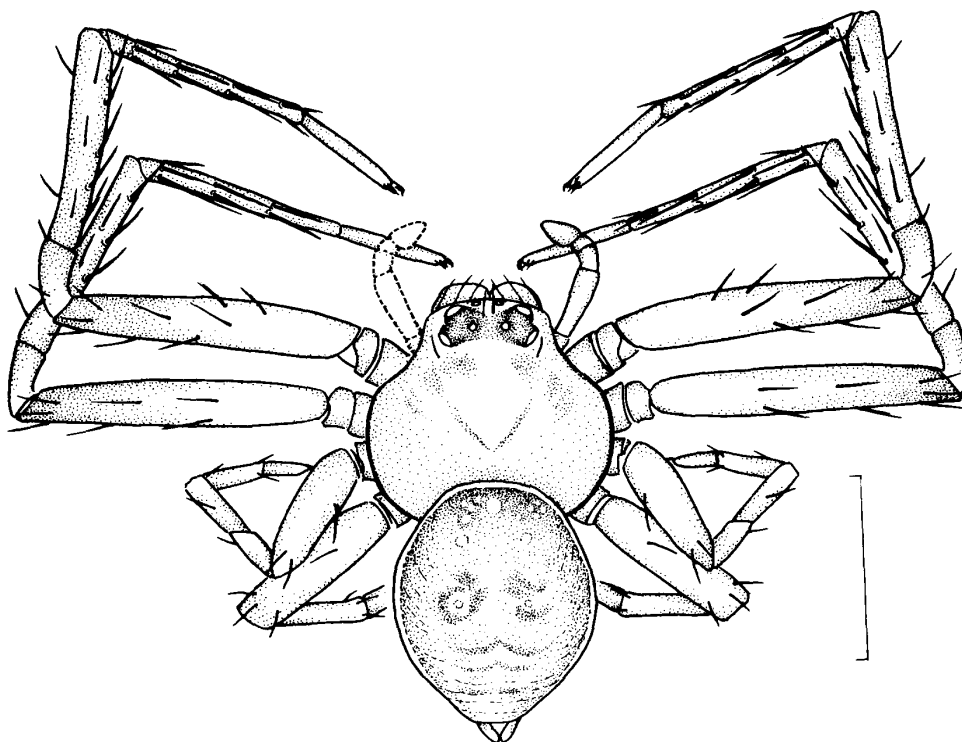
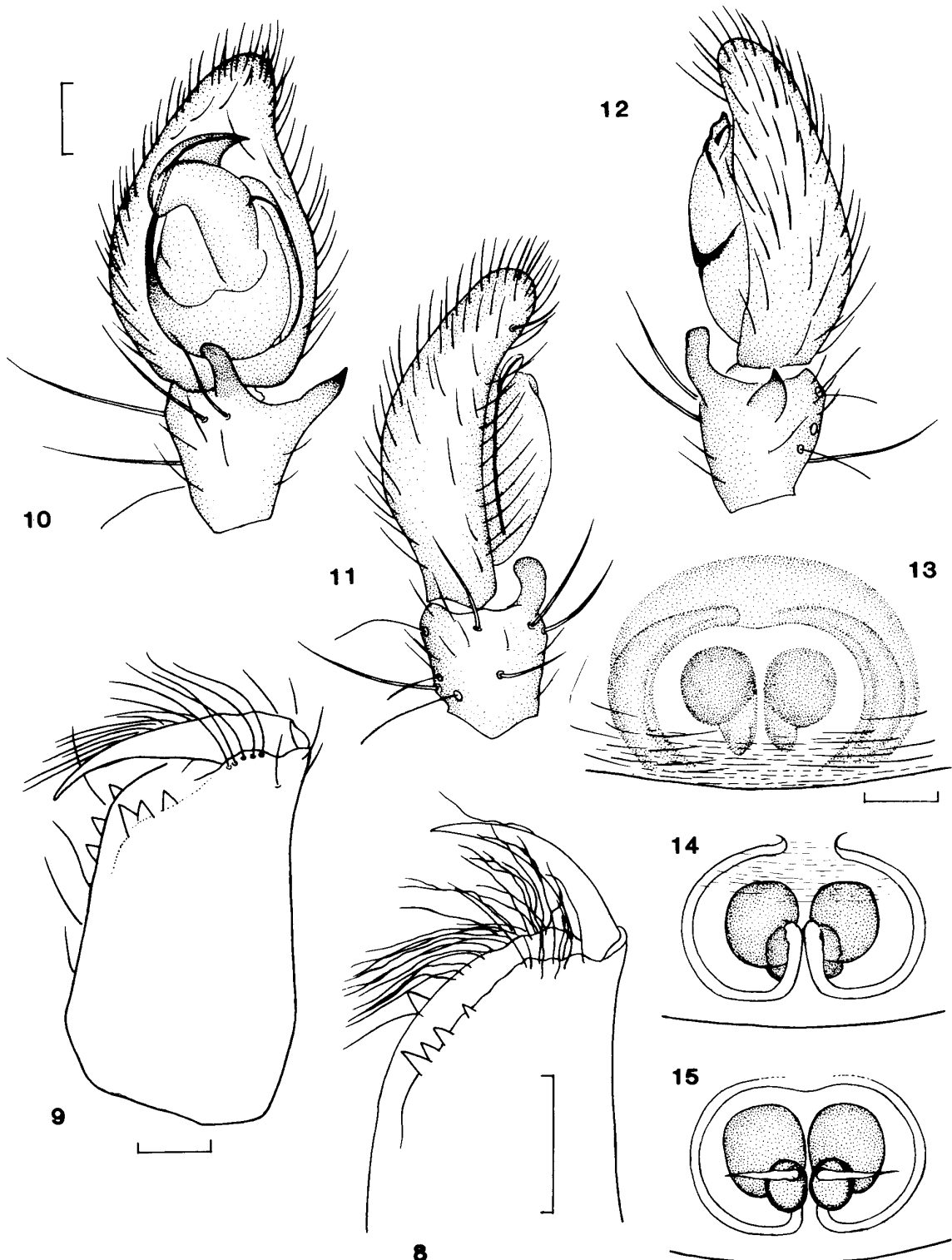


Fig. 7. *Sanmenia kohi* sp. nov., male holotype from Singapore. (Scale: 1 mm.)



Figs. 8–15. *Sanmenia kohi* sp. nov.—8, Chelicera of male; 9, chelicera of female; 10, male palp, ventral view; 11, same, prolateral view; 12, same, retrolateral view; 13, female genitalia (epigynum), ventral view; 14, same, internal organ, ventral view; 15, same, dorsal view. 8, 10–12, Male holotype; 9, 13–15, female paratype. (Scales: 0.1 mm.)

4.00, PLE/PME ♀ 1.43, ♂ 1.45, AME-AME/AME-ALE ♀ ♂ 1.50, PME-PME/PME-PLE ♀ 1.00, ♂ 0.86, median ocular area slightly longer than wide (length/width ♀ 1.08, ♂ 1.11), wider behind than in front (anterior width/posterior width ♀ 1.71, ♂ 1.63), clypeus/AME-AME ♀ 1.67, ♂ 1.00. Chelicera vertical, with scopula, both the margins of fang furrow with teeth (Figs. 8–9); labium wider than long (length/width ♀ 0.75, ♂ 0.70); sternum longer than wide (length/width ♀ 1.27, ♂ 1.14). Legs with many strong spines, leg formula II–I–IV–III, tarsus with claw tuft, tarsal claws I–II with four teeth, III–IV with two or three teeth; female palp with a claw.

Spiniformation of legs. ♀: Femur: I–IV dorsal 0–1–0–1, I prolateral and ventral 0–1–1–0, respectively; patella: I–IV dorsal 1–1 (weak), retrolateral 1 (weak); tibia: I–II dorsal 1–0–1, pro- and retrolateral 1–1–1, respectively, ventral 2–2–2–2–2, III–IV dorsal 1–1 (weak), prolateral 1–1, III retrolateral 1, ventral 1–1–2, IV retrolateral 1–1, ventral 2 (apical); metatarsus: I–II pro- and retrolateral 1–0–1 (apical), respectively, ventral 2–2–2–2, III–IV pro- and retrolateral 1–0–1 (apical), respectively, ventral 2 (apical). ♂: Femur: I–IV dorsal 0–1–1, I–II pro- and retrolateral 0–1–1–1–1, respectively, I ventral 0–1–1–0, III–IV pro- and retrolateral 0–0–1, respectively; patella: I–IV dorsal 1–0–1 (weak), retrolateral 1; tibia: I–IV dorsal 1–1 (weak), I–II pro- and retrolateral 1–1–1, respectively, ventral 2–2–2–2–2, III prolateral 0–1, retrolateral 1, IV pro- and retrolateral 1–1, respectively, III–IV ventral 2 (apical); metatarsus: I–II pro- and retrolateral 1–0–1 (apical), respectively, ventral 2–2–2–2, III–IV pro- and retrolateral 1–2 (apical), respectively, ventral 2 (apical).

Male palp (Figs. 10–12). Tibia with ventral and retrolateral apophyses; the ventral one digitiform, long, the retrolateral one dentiform and simple. Bulb longer than wide, with large conductor and long, spiniform embolus.

Opisthosoma longer than wide (length/width ♀ 1.25, ♂ 1.29), furnished with short hairs. Female genitalia (Figs. 13–15): Epigynum small, without hood; intromittent orifices situated in the anterior part, internal apparatus seen through integument, intromittent canal very long, spermatheca globular and large.

Coloration and markings (Fig. 7). ♀, Prosoma yellowish brown, mottled with brown, eye area darker; chelicerae, maxillae and labium yellow, sternum light yellowish brown; legs and palps light yellowish brown, tibiae, metatarsi and tarsi darker. Opisthosoma yellowish brown, with a pair of indistinct black markings and many white spots, ventral side yellowish brown. ♂, Prosoma light yellowish brown, margined with black, much sheenier than in female, with indistinct black markings; chelicerae, maxillae, labium and sternum light yellowish brown; legs I–II light brown, III–IV yellow, femora ventrally with black spots. Opisthosoma dorsally light yellow, margined with blackish brown, with a pair of black markings.

Remarks. ONO and SONG (1986) described a peculiar thomisid of the

subfamily Stephanopinae, *Cupa zhengi*, from Japan and China. At that time, the genus *Cupa* STRAND, 1906, was known to be monotypic with the type species, *Cupa typica* BÖSENBERG et STRAND, 1906, which was never rediscovered since the original description made with the only female holotype (ONO, 1988). Recently, SONG and KIM (1992) obtained both sexes of a *Cupa* species from China and described it under the name of *Cupa gongi*. Having compared the male characteristics between *Cupa zhengi* and *C. gongi*, they concluded that both the species are not congeneric, and established a new and monotypic genus, *Sanmenia*, for *Cupa zhengi*. The present new species resembles *Sanmenia zhengi* not only in the general feature and coloration but also in the structure of male palp and female genitalia. These two species are closely related to each other. However, they are distinguishable from each other by the shape and size of spermatheca in the female genitalia and the shape of retrolateral tibial apophysis of male palp.

The specific name is given after Mr. Joseph K. H. KOH, the collector of the type specimens of this species and the author of A Guide to Common Singapore Spiders published in 1989.

Family Salticidae

Onomustus kanoi sp. nov.

[Japanese name: Kano-haetori]

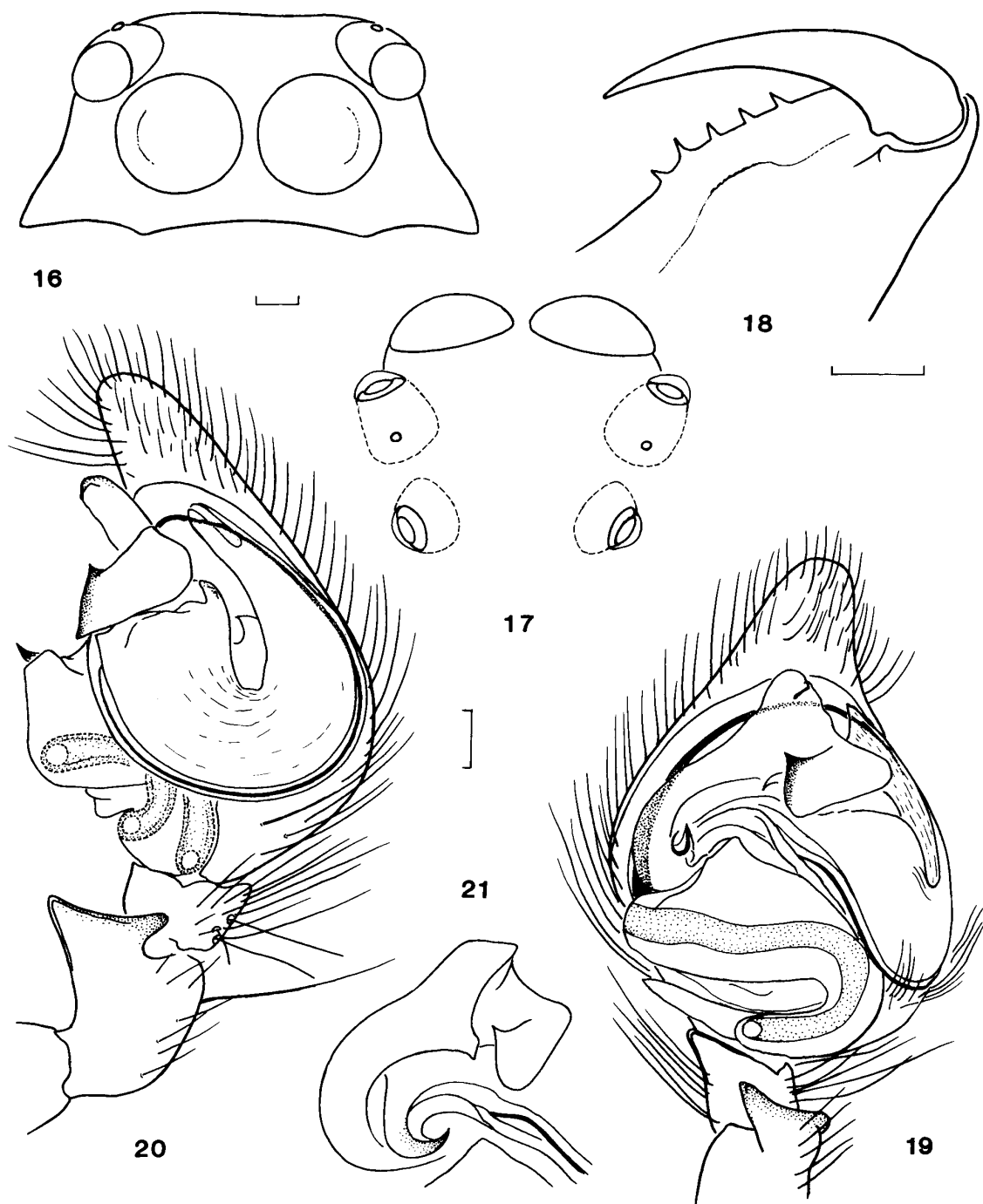
(Figs. 16–21, 23)

Type specimen. Holotype: ♂, S of Mt. Ubashiyama, ca 120 m alt., Nago-shi, Okinawa Island, the Ryukyu Islands, southwestern Japan, 18–III–1993, H. ONO leg. (NSMT–Ar 3227).

Other specimens examined. 4 juv. ♀ 1 juv. ♂, same data as for the holotype (NSMT–Ar 3228).

Description (based on the male holotype). Measurement: Body length 4.67 mm; prosoma length 2.00 mm, width 1.33 mm; opisthosoma length 2.59 mm, width 0.96 mm; lengths of legs [total length (femur + patella + tibia + metatarsus + tarsus)]: I 7.22 mm (2.00 + 0.74 + 2.00 + 1.63 + 0.85), II 6.57 mm (1.85 + 0.67 + 1.78 + 1.59 + 0.60), III 7.15 mm (1.93 + 0.67 + 1.70 + 2.18 + 0.67), IV 8.45 mm (2.22 + 0.67 + 2.11 + 2.67 + 0.78).

Prosoma. Carapace longer than wide (length/width 1.50), high, fovea indistinct. Eyes arranged in four transverse rows; eye area wider than long (length/width 0.83), widest at the second row (ALE–ALE), occupying more than one third of the length of carapace; AME:ALE:PME:PLE = 18:8:1:5; AME very large, close to each other, occupying almost full width of facies, clypeus very narrow; ALE/AME 0.44, PLE/PME 5.00, ALE and PLE set on low tubercles black, PME minute and situated on the tubercle of ALE, PME closer to ALE than to PLE, ALE–ALE wider than PLE–PLE (32:27). Chelice-



Figs. 16–21. *Onomustus kanoi* sp. nov., male holotype.—16, Carapace, frontal view; 17, eyes, dorsal view; 18, chelicera; 19, male palp, ventral view; 20, same, retrolateral view; 21, terminal part of embolus and conductor, prolateral view. (Scales: 0.1 mm.)

Figs. 22–24 (on page 167). 22 (Top), *Stegodyphus tibialis* (O. PICKARD-CAMBRIDGE, 1869), male from Thailand (body length 8.40 mm); 23 (bottom, left), *Onomustus kanoi* sp. nov., juvenile female specimen from Japan (body length 4.44 mm); 24 (bottom, right), *Cyrtarachne melanoleuca* sp. nov., female holotype from Thailand (body length 4.52 mm).



Figs. 22-24.

rae vertical, promargin of fang furrow with five teeth, retromargin with a large protuberance with minute denticles; maxillae pararell, with scopula; labium slightly wider than long (length / width 0.86), sternum longer than wide (length / width 1.26). Leg formula IV-I-III-II; legs relatively short.

Spiniformation of legs. Femur: I-IV dorsal 0-1-0-1-1, pro- and retrolateral 0-0-0-0-1, respectively; tibia: I dorsal 1-0-1-0, ventral 2-2-2-2-2-2, II dorsal 2-1, ventral 2-0-2-2-2, III-IV dorsal 2-2, ventral 1; metatarsus: I-II retrolateral 1-0-0-0, ventral 2-2-2-0, III-IV pro- and retrolateral 1-1, respectively, ventral 2.

Male palp (Figs.19-21). Patella with retrolateral apophysis wide and developed. Tibia much shorter than patella, without retrolateral apophysis. Bulb with complicated structure; tegulum not expanded but depressed, duct clearly visible, a spiniform tegular apophysis present; embolic division occupying a large place in bulb, with developed apophyses (median apophysis and conductor) conducting the embolus, conductor with developed embolic guide, terminal part of the conductor with a strong, rostrated apophysis; embolus filiform, very long.

Opisthosoma elongate (length / width 2.70), spinnerets long.

Coloration and markings (Fig. 23). In alcohol: Prosoma yellow, eye tubercles black; chelicerae, maxillae and labium pale yellowish white, sternum white; palps and legs pale yellow, tibiae of legs I-II retrolaterally with black bars in proximall and distal parts. Opisthosoma white without any marking. Colour in life light green.

Remarks. The genus *Onomustus* was established by SIMON (1900) on the basis of the type species, *Onomustus nigricauda* SIMON, 1900, from Ceylon (Sri Lanka). Other than the type species, only three species were hitherto known, that is, *O. quinquenotatus* SIMON, 1900, from Sri Lanka, *O. patellalis* SIMON, 1900, from India, and *O. complexipalpis* WANLESS, 1980, from Borneo, Indonesia. Of these, *O. complexipalpis* is closest to the present new species in the structure of the male palpal organ. However, *O. kanoi* can be easily distinguished from the Indonesian species by the shape of median apophysis and conductor. The genus was newly recorded from Japan. Though the spiders of this genus seem to be rare, their distributional range covers a wide area in tropical Asia.

The new species is dedicated to Dr. Rokuro KANO, for his contribution to the medical zoology and entomology, especially in Diptera.

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